WHAT IS CLAIMED IS:

- 1. A method of killing a cell comprising:
 - a) contacting said cell with a first composition comprising an agent that increases intracellular O_2^- ; and
 - b) contacting said cell with a second composition comprising 2-methoxyestradiol.
- 2. The method of claim 1, wherein said cell is a cancer cell.
- 3. The method of claim 2, wherein said cancer cell is derived from a solid tumor.
- 4. The method of claim 2, wherein said cancer cell is a leukemia cell.
- 5. The method of claim 1, wherein said cell is a human cell.
- 6. The method of claim 1, wherein said compound that increases intracellular O₂ is rotenone.
- 7. The method of claim 1, wherein said compound that increases intracellular O_2^- comprises bleomycin.
- 8. The method of claim 1, wherein said compound that increases intracellular O_2^- comprises daunorubicin.
- 9. The method of claim 1, wherein said compound that increases intracellular O_2^- comprises epirubcin.
- 10. The method of claim 1, wherein said agent that increases intracellular O_2^- comprises TNF-alpha.

- 11. The method of claim 1, wherein said agent that increases intracellular O_2^- comprises heat.
- 12. The method of claim 1, wherein said agent that that increases intracellular O_2^- comprises an arsenate.
- 13. The method of claim 1, wherein said agent that that increases intracellular O_2 comprises a retinoic acid derivative.
- 14. The method of claim 1, wherein the administration of said first composition and said second composition is substantially concurrent.
- 15. The method of claim 1, wherein the administration of said first composition is subsequent to the administration of said second composition.
- 16. The method of claim 1, wherein the administration of said first composition is prior to the administration of said second composition.
- 17. The method of claim 1, wherein said first and said second compositions are combined in a single formulation.
- 18. A method of treating cancer comprising administering to a host a composition comprising 2-methoxyestradiol and an agent that increases intracellular O_2^- .
- 19. The method of claim 18, wherein said agent that increases intracellular O_2^- is rotenone.
- 20. The method of claim 18, wherein said agent that increases intracellular O₂ comprises bleomycin.

- 21. The method of claim 18, wherein said agent that increases intracellular O_2^- comprises daunorubicin.
- 22. The method of claim 18, wherein said agent that increases intracellular O_2^- comprises epirubcin.
- 23. The method of claim 18, wherein said agent that increases intracellular O_2^- comprises TNF-alpha.
- 24. The method of claim 18, wherein said agent that increases intracellular O_2^- comprises heat (hyperthermia).
- 25. The method of claim 18, wherein said agent that that increases intracellular O_2 comprises an arsenate.
- 26. The method of claim 18, wherein said agent that that increases intracellular O_2^- comprises a retinoic acid derivative.
- 27. The method of claim 18, wherein said host is a human.
- 28. The method of claim 18, wherein the administration of said first composition and said second composition is substantially concurrent.
- 29. The method of claim 18, wherein the administration of said first composition is subsequent to the administration of said second composition.
- 30. The method of claim 18, wherein the administration of said first composition is prior to the administration of said second composition.
- 31. The method of claim 18, wherein said first and said second compositions are contained within a pharmaceutically acceptable composition.

- 32. The method of claim 31, wherein said pharmaceutically acceptable composition includes a pharmaceutically acceptable carrier.
- 33. The method of claim 31, wherein said pharmaceutical composition is formulated for oral administration.
- 34. The method of claim 31, wherein said pharmaceutical composition is formulated for parenteral administration.
- 35. The method of claim 31, wherein said pharmaceutical composition is formulated for administration by injection.
- 36. The method of claim 18, wherein said host has cancer.
- 37. The method of claim 36, wherein said cancer is a solid tumor.
- 38. The method of claim 36, wherein said cancer is a leukemia.
- 39. The method of claim 18, wherein said first and said second compositions are combined in a single formulation.
- 40. A composition comprising 2-methoxyestradiol and a second compound that increase intracellular O_2 .
- 41. The composition of claim 40, wherein said compound that increases intracellular O_2 comprises rotenone.
- 42. The composition of claim 40, wherein said compound that increases intracellular O₂ comprises bleomycin.

- 43. The composition of claim 40, wherein said compound that increases intracellular O_2^- comprises daunorubicin.
- 44. The composition of claim 40, wherein said compound that increases intracellular O₂ comprises epirubicin.
- 45. The composition of claim 40, wherein said agent that that increases intracellular O_2^- comprises an arsenate.
- 46. The composition of claim 40, wherein said agent that that increases intracellular O₂ comprises a retinoic acid derivative.
- 47. The composition of claim 40, wherein said composition is a pharmaceutically acceptable composition.
- 48. The composition of claim 40, wherein said compound that increases intracellular O_2^- comprises tumor necrosis factor-alpha.
- 49. The composition of claim 48, wherein said pharmaceutically acceptable composition includes a pharmaceutically acceptable carrier.
- 50. The composition of claim 48, wherein said pharmaceutical composition is formulated for oral administration.
- 51. The composition of claim 48, wherein said pharmaceutical composition is formulated for parenteral administration.
- 52. The composition of claim 48, wherein said pharmaceutical composition is formulated for administration by injection.